

Action, which states “Higuchi and Noguchi merely lack replacing hydrogen atoms with fluorine atoms. Kusano teaches of a surface treatment method where hydrogen atoms have been replaced with fluorine atoms . . . Modifying the methods of Higuchi and Noguchi by replacing the hydrogen atoms with fluorine atoms would have been obvious.” (Emphasis added.) Applicants’ representative argued that the first statement of the Examiner’s position is unfounded, because neither Higuchi nor Noguchi teach a hydrocarbon. Thus, Applicants’ representative stated that, even assuming, for the sake of argument, that Kusano would motivate one skilled in the art to replace the hydrogen atoms in the polishing agents of Higuchi and Noguchi with fluorine, this modification would still not result in Applicants’ claimed invention.

The Examiner discussed these arguments with his Supervisor. During the interview of December 13, 2007, the Examiner stated that he agrees that neither Higuchi nor Noguchi teaches a hydrocarbon, contrary to his assertion in the Advisory Action. However, the Examiner stated that he and his Supervisory Examiner will likely take the position that the claims are still obvious, on the grounds that it would be obvious to substitute one medium (the unsaturated hydrocarbon compound of Kusano et al.) for another medium (the mediums of Higuchi and Noguchi) to obtain a predictable result.

In view of the Examiner’s position, Applicants respectfully request that the Examiner carefully consider the following comments.

#### **Patentability Arguments**

The patentability of the present invention over the disclosures of the references relied upon by the Examiner in rejecting the claims will be apparent upon consideration of the following remarks.

#### **Rejection Under 35 U.S.C. § 103(a)**

The rejection of claims 1, 3-13, 15 and 16 under 35 U.S.C. § 103(a) as being unpatentable

over Higuchi et al. in view of Noguchi et al. and Kusano et al. is respectfully traversed.

**1. One of the essential features of the presently claimed invention cannot be derived from the combination of Higuchi, Noguchi and Kusano**

One of the essential features of the presently claimed invention is that "the liquid medium including no hydrogen atom is a saturated hydrocarbon in a molecule of which a hydrogen atom or hydrogen atoms are all substituted with a fluorine atom or fluorine atoms". However, none of Higuchi et al., Noguchi et al. nor Kusano et al. disclose this essential feature. The medium of Kusano et al. is a gas containing a fluorinated compound in the form of a cyclic or unsaturated hydrocarbon having all of the hydrogen atoms thereof replaced by halogen groups including fluorine atoms. (Please see Kusano et al., column 3, lines 24-28.) Kusano et al. do not disclose a saturated hydrocarbon liquid medium. Thus, this essential feature of the presently claimed invention cannot be derived from the combination of Higuchi, Noguchi and Kusano. Therefore, the cited combination of references does not render Applicants' claims unpatentable.

**2. Those skilled in the art would not consider substituting the gaseous medium of Kusano et al. for the liquid mediums of Higuchi et al. or Noguchi et al. in a mechanically polishing process.**

The process of Kusano et al. uses a gas containing a fluorinated compound. It is true that Kusano et al. describe fluorinated liquid compounds on column 4, lines 65-66. However, Kusano et al. also disclose, on column 3, line 65 to column 5, line 4, that "Fluorinated compounds which are liquid at room temperature, but have a relatively high vapor pressure may be supplied either directly in vapor form or by bubbling an inert gas into the liquid fluorinated compound. In turn, fluorinated compounds which are not gaseous and have a relatively low vapor pressure may be used after heating them to a gaseous state having a high vapor pressure." That is, the process of

Kusano et al. does not relate to a process for treating a surface in the presence of a liquid medium.

On the other hand, the mechanical polishing of the presently claimed process is essentially performed in the presence of a liquid medium. Mechanical polishing with polishing chips only (i.e., without a liquid medium) is not practical in consideration of a polishing efficiency and prevention of heat generation during polishing. Therefore, it is preferable to perform mechanical polishing with polishing chips and a liquid medium (a coolant) charged simultaneously inside the vacuum member. (Please see page 16, lines 2-7 of Applicants' originally filed specification.) Actually, an average polishing-off thickness in the range from about 0 to 5  $\mu\text{m}$  in a case of a dry polishing (without a liquid medium) shows no polishing-off on the sample in mechanically polishing, as disclosed on page 29, last line - page 30, line 2, and Table 2 of Applicants' originally filed specification. This result is also demonstrated on page 24, lines 5-13 of the Rule 1.132 Declaration, submitted September 24, 2007. Thus, if the gaseous medium of Kusano et al. is used in the mechanically polishing instead of a liquid medium, the problems of heat generation and no polishing-off will arise. Therefore, contrary to the Examiner's assertion, those skilled in the art would not consider substituting the gaseous medium of Kusano et al. for the liquid medium of Higuchi et al. or Noguchi et al. in mechanically polishing process. Thus, Applicants again assert that the cited combination of references does not render Applicants' claims unpatentable.

### **3. Kusano et al. is not relevant prior art against the claimed invention**

Kusano et al. disclose "glow discharge plasma treatment" using a gas as a process for treating a surface. On the other hand, the presently claimed invention is directed to "mechanically polishing" using a liquid. The "glow discharge plasma treatment" is quite different from the "mechanically polishing" as described below. U.S. Patent No. 5,403,453 to Roth et al., a partial copy of which is enclosed herewith, discloses a method for glow discharge

plasma treatment of polymer materials at atmospheric pressure. Roth et al. describe (on column 1, lines 46-65) that "[t]he term "plasma" usually describes a partially ionized gas composed of ions, electrons and neutral species. This state of matter may be produced by the action of either very high temperatures, or strong direct current (DC) or radio frequency (RF) electric fields . . . Glow discharge plasmas are produced by free electrons which are energized by an imposed DC or RF electric field and then collide with neutral molecules. These neutral molecule collisions transfer energy to the molecules and form a variety of active species which may include photons, metastables, individual atoms, free radicals, molecular fragments, monomers, electrons and ions. These active species are chemically active and/or capable of physically modifying the surface and may therefore serve as the basis of new surface properties of chemical compounds and property modifications of existing compounds."

In the mechanical polishing of the presently claimed invention, a plasma, i.e., a partially ionized gas, is not necessary at all. The liquid medium of the presently claimed invention does not become a plasma in the mechanical polishing of the presently claimed process. Furthermore, in order to generate a plasma, an action of either very high temperatures, or strong direct current or radio frequency electric field is not needed. Thus, the mechanical polishing of the presently claimed invention is quite distinct from the glow discharge plasma treatment of Kusano et al.

The heading for MPEP 2141.01(a) is "To Rely On A Reference Under 35 U.S.C. 103, It Must Be Analogous Prior Art." This section of the MPEP states that the Examiner must determine what is "analogous prior art" for the purpose of analyzing the obviousness of the subject matter at issue. The MPEP further states that any need or problem known in the field of endeavor at the time of the invention and addressed by the patent or application at issue can provide a reason for combining the elements in the manner claimed." *KSR International Co. v. Teleflex Inc.*, 82 USPQ2d 1385, 1397 (U.S. 2007). Thus a reference in a field different from that of applicant's endeavor may be reasonably pertinent if it is one which, because of the matter with

which it deals, logically would have commended itself to an inventor's attention in considering his or her invention as a whole. In this case, for the reasons discussed above, one of skill in the art would not have considered the teachings of Kusano et al. when considering Applicants' claimed invention.

Accordingly, for the reasons clearly explained above, Applicants' pending claims are clearly patentable over the cited combination of references.

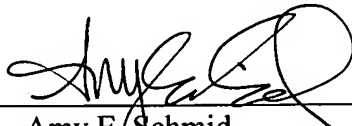
**Conclusion**

Therefore, in view of the foregoing remarks, (as well as the amendments and remarks submitted previously), it is submitted that the ground of rejection set forth by the Examiner has been overcome, and that the application is in condition for allowance. Such allowance is solicited.

If, after reviewing this Amendment, the Examiner feels there are any issues remaining which must be resolved before the application can be passed to issue, the Examiner is respectfully requested to contact the undersigned by telephone in order to resolve such issues.

Respectfully submitted,

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